

Group Exercise Wrap-Up

NPDES Permit Writers' Specialty Workshop:
Addressing Nutrient Pollution in NPDES Permits

Arlington, Virginia
November 3-5, 2015



Group Exercise Wrap-Up

- Review results
- General observations
- Questions and comments



	Anacostia				Chesapeake				Choptank			
	TP Limits		TN Limits		TP Limits		TN Limits		TP Limits		TN Limits	
	µg/L	lbs/day	mg/L	lbs/day	µg/L	lbs/day	mg/L	lbs/day	µg/L	lbs/day	mg/L	lbs/day
Annual Average												
AML	112	27.9	1.66	416	254	50.8	3.77	755	189	37.9	3.92	785
AWL												
MDL												

	Rappahannock				Rock Creek				Severn			
	TP Limits		TN Limits		TP Limits		TN Limits		TP Limits		TN Limits	
	µg/L	lbs/day	mg/L	lbs/day	µg/L	lbs/day	mg/L	lbs/day	µg/L	lbs/day	mg/L	lbs/day
Annual Average											3.42	798
AML	165	38.6	1.03	241	214	49.9	2.50	584	218	50.9		
AWL	232	54.2	1.34	314	300	70.0	3.26	760				
MDL												

A Few General Observations



- Criteria or tools for interpreting narrative important
 - Numeric criterion available (Scenario A)
 - TMDL target for Clear Lake
 - Using Clear Lake TMDL target to interpret narrative for TP
 - Decision not to interpret narrative criterion for TN for Shimmering Lake (Severn) because TMDL for Clear Lake addressed TP only
- Decision to calculate WQBELs to protect Shimmering Lake major consideration for final limits
 - For this class, all limits calculated to protect downstream Shimmering Lake were more stringent than limits with same averaging period calculated to protect Sparkling River
 - Consequently, all final limits were driven by criteria for Shimmering Lake except the TN annual average limit calculated by Severn (because Severn did not calculate TN limits to protect the Shimmering Lake—see above)



A Few General Observations



- TMDL target had a significant influence on criteria interpretation (magnitude, duration, and frequency)
 - **Magnitude, Duration, and Frequency:** When interpreting narrative for TP for Shimmering Lake, all Scenario B groups used the Clear Lake TMDL target
 - **Duration and Frequency:** All Scenario A groups interpreted numeric TP criterion as 30-day average)
 - Groups cited similarities between the TMDL target and available criteria as important



A Few General Observations



- Interpretation of duration and frequency components has a significant impact on calculations
 - Scenario A groups used ecoregional criteria (annual averages) for interpreting narrative for Sparkling River
 - Scenario A groups applied the more stringent Shimmering Lake criteria as 30-day averages
 - All limits to protect Shimmering Lake more stringent than limits to protect Sparkling River
 - Average annual TP limits calculated for Sparkling River > Average monthly TP limits calculated for Shimmering Lake



A Few General Observations



- “Local” criteria can drive limits
- For example:
 - Scenario A total nitrogen lake criterion (0.50 mg/L) could be interpreted as an annual average for Shimmering Lake
 - Ecoregional annual average river criterion (0.69 mg/L) could be used to interpret narrative criterion for Sparkling River
 - **If groups had interpreted both as annual averages**, the most stringent WQBELs would have been those derived to meet river criterion
 - **Why?**—Criteria are close together, but available dilution to meet river criterion is 50% of available dilution to meet lake criterion



A Few General Observations



- Other critical conditions are important too
 - Scenario A groups all assumed the same criteria with the same duration and frequency
 - Yet, none of the groups in Scenario A had the same limits
 - Groups made different decisions regarding
 - Appropriate critical receiving water flow (30Q5 vs. harmonic mean; 7Q10 vs. 30Q5)
 - Appropriate critical upstream receiving water concentration (maximum vs. average)
 - Critical effluent flow (maximum daily vs. maximum monthly average)



A Few General Observations



- Other critical conditions are important too
- **Example:** Rappahannock vs. Severn TP limits
 - Criteria and duration and frequency were the same
 - Critical upstream concentration and critical effluent flow were the same
 - Critical receiving water flows were different
 - Rappahannock: 30Q5 for annual average; 7Q10 for 30-day avg.
 - Severn: harmonic mean for annual average; 30Q5 for 30-day avg.

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A Few General Observations



- All calculated limits for Rappahannock and Severn groups (note that not all were selected by the groups as final limits for their permit)

	Rappahannock		Severn	
	TP Limits		TP Limits	
	µg/L	lbs/day	µg/L	lbs/day
Annual Average	143	33.5	199	46.5
AML	165	38.6	218	50.9
AWL	232	54.2	306	71.4
MDL	402	93.8	529	124

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